

BOTANY.—*Studies in Lonchocarpus and related genera, V: New species from Middle America and the Lonchocarpus guatemalensis complex.*<sup>1</sup> FREDERICK J. HERMANN, U. S. Department of Agriculture.

Continued investigations of available Mexican and Central American collections of the *Lonchocarpus* group has necessitated the recognition of the following novelties and realignments.

*Terua* Standley & Hermann, gen. nov.  
Leguminosarum

Frutex vel arbor parva ramis alternis; folia alterna, imparipinnata, stipulata; foliola opposita, exstipellata, integra, plus minusve punctata; paniculae 1–3 axillares; corollae alae carinae adhaerentes; stamen vexillare ima basi liberum, medio cum caeteris in tubum clausum connatum; legumen compressum suturis incrassatis, sutura ventrali dehiscens; semina 1–4, subreniformia, hilo armillato.

Shrub or small tree with alternate branches; leaves alternate, imparipinnate, stipulate, glabrous; leaflets opposite, exstipellate, irregularly translucent-punctate, the nerves (except the midrib) not impressed, the margins entire; flowers borne on axillary peduncles; calyx at maturity broadly cupuliform (urceolate in the bud); wings of the corolla strongly adherent to the apical half of the keel; stamens monadelphous, fenestrate, the basal 2 mm of the tenth stamen free; anthers two-celled, versatile, lanceolate; style arcuate; stigma minute, terminal, glabrous; legume strongly compressed, stipitate, both sutures thickened, 1–4-seeded, elastically dehiscent along the ventral (vexillar) suture; seeds subreniform, compressed, the hilum surrounded by a membranaceous ridge.

A single species is known, native to the valley of the Río Yeguaré, Honduras. Because of its dehiscent pods it must be referred to the tribe Galegeae rather than to the Dalbergieae (characterized by completely indehiscent legumes) with which it has very close affinity in most other respects. It appears, indeed, to be a more markedly transitional type between the two tribes than any genus so far known. Its mimicry of *Lonchocarpus* is striking in such features as the adherence of the wings of the corolla to the keel and the clearly punctate young leaves (the translucent cells, however, tending to plug up and become opaque with age). Other lonchocarpoid charac-

teristics, such as the conspicuous resin-blisters on calyx and corolla, the rugose, vermiculate petioles, and monadelphous, fenestrate, stamen-tube (a structure common in the Phaseoleae and some of the Galegeae but in the Dalbergieae known only in *Lonchocarpus*, *Derris* and *Piscidia*, as pointed out by Bentham) are shared by a few genera of the Galegeae such as *Willardia*. *Terua* clearly falls nearest to *Willardia* in the Galegeae but differs from it in having the wing petals strongly adherent to the keel, the claw of the standard appendaged at the base, pods without resin-duets, and seeds with the hilum bordered by a membranaceous collar. The genus is dedicated to Terua Williams (Mrs. Louis O. Williams), of the Escuela Agrícola Panamericana, Tegucigalpa, Honduras.

*Terua vallicola* Standley & Hermann, sp. nov.

Arbor gracilis (4–6 m) vel frutex (2–4 m); stipulae inconspicuae; folia 5-foliata; petioluli exstipellati, vermiculati, rugosi; foliola late elliptica vel oblongo-ovata vel ovato-lanceolata, 1.8–10 cm longa, 0.8–5 cm lata, subcoriacea, apice obtusa vel emarginata, basi obtusa vel acuta marginibus aliquantum revolutis; paniculae folia subaequant; flores 11–14 mm longi, glabri, subtiliter nervati et canalibus resinosis dense maculati; calyx 2.5–3 mm longus maturitate 4–6 mm latus dentibus brevissimis vel obsoletis; vexillum obovatum, 11 mm longum, 9 mm latum, basi subauriculatum apice profunde emarginatum, ungue basi apiculato; legumen ellipticum (ca. 4 x 2.5 cm) vel irregulariter oblongum (ca. 8 x 2 cm) vel lineari-oblongum (ca. 7 x 1.5 cm), apice acuto vel mucronato, coriaceum, glabrum.

Slender tree or tall shrub, 2–6 m high, with terete glabrous branches thickly dotted with stramineous lenticels; stipules rudimentary, scale-like, broadly ovate; leaves 5-foliolate, 7–15 cm long, the petioles 1.5–3 cm long, glabrous, the rachis and upper part of the petiole (terete at the base) deeply canaliculate; petiolules exstipellate, 2–3 mm long, vermiculate, strongly cross-wrinkled, shallowly canaliculate above; leaflets broadly elliptic to oblong-ovate or ovate-lanceolate, 1.8–10 cm long, 0.8–5 cm wide, subcoriaceous, the apex obtuse to emarginate, rounded to abruptly tapering at the base, 4–7 of the second-

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ary nerves prominent especially beneath, the margins somewhat revolute; panicles 5–10 cm long, about equaling the leaves, loosely few-flowered, the primary peduncle 1–3 cm long, secondary peduncles 3–7 mm long, with a minute (0.5 mm) ovate bract at the base, pedicels 2–3 mm long, bearing a blunt to acute, ovate bract (0.5 mm) at their base and a pair of frequently larger (0.5–1 mm), narrowly ovate bractlets about 1 mm below the flower; flowers 11–14 mm long, dark red-purple, finely and conspicuously nerved and thickly dotted with resin-ducts; calyx 2.5–3 mm long, 4–6 mm wide, more or less plainly dotted or lined with resin ducts, glabrous without except for the minutely ciliolate margin, the apical third strigulose within, the teeth very shallow or obsolete though generally prominent in the bud; standard obovate, 11 mm long, 9 mm wide, subauriculate at the base, deeply emarginate, glabrous, the center dark green, the short claw (1.5 mm) with an inverted U-shaped appendage near the base; wings with a claw 2 mm long and an oblong blade 8 mm long, 2.5–3 mm wide, glabrous; keel 8.5 mm long (blade 6.5 mm, claw 2 mm), the basal half free from the wings, white-sericeous toward the apex; stamen-tube and the free portion of the filaments glabrous; ovary sericeous along both margins; style more or less ciliate along the upper margin, frequently also along the lower; legume elliptic (averaging 4 x 2.5 cm) to irregularly oblong (averaging 8 x 2 cm) to linear-oblong (averaging 7 x 1.5 cm), light brown, glabrous, coriaceous, attenuate to abruptly rounded and stipitate at the base, the apex abruptly acute to mucronate; seeds 1–4, dark reddish brown, subreniform, glossy, 6–8 mm long, 9–12 mm wide, the hilum oval, 1.5–2 mm long, surrounded by an irregular, translucent, orange-yellow collar.

HONDURAS: DEPT. EL PARAÍSO: In barranca along Río Yeguaré near Las Casitas, alt. 900 m, Dec. 4, 1946, *L. O. Williams & A. Molina R. 11072* (F—type); in quebrada along creek near Las Casitas, alt. 850 m, Jan. 5, 1947, *L. O. Williams & A. Molina R. 11532* (F); scrub forest near Las Casitas, alt. 850 m, Nov. 16, 1947, *L. O. Williams & A. Molina R. 13414* (F); rocky stream bank, vicinity of Galeras, 800–900 m, Jan. 5, 1947, *Standley et al. 1991* (F; USNA); oak forest on Montaña de Yuscaraú, alt. 2000 m, Dec. 7, 1947, *A. Molina R. 602* (F). DEPT. MORAZÁN: along junction of Gallo and Jicarito Creeks, Jicarito, alt. 1000 m, June 19, 1947, *A. Molina R. 145* (F); grassy slopes in pine forest near San

Antonio, alt. 1200 m, July 17, 1947, *A. Molina R. 336* (F); dense moist forest, Quebrada Seca, on road between El Zamorano and San Antonio de Occidente, alt. ca. 900 m, Aug. 5, 1947, *Standley 11745* (F; USNA).

***Lonchocarpus lasiotropis*, sp. nov.**

Arbor 7–30 m; stipuli acerosi, strigosi, 6 mm longi; folia 13- (interdum 11- raro 9-) foliata; foliola elliptico-lanceolata, acuminata, chartacea, epunctata; inflorescentia terminalis, paniculis racemiformibus laxifloris; pedicelli 3–3.5 mm longi, fulvo-strigosi bracteolis duobus lanceolatis medio praediti; flores 10–12 mm longi; calyx cyathiformis dente carinali (1–1.5 mm longo) deltoideo-acuminato insigni; vexillum extus uberrime sericeum; alarum auriculae pusillae; carinae petala semiorbicularia spisse sericeo-strigosa trichomis rigidis albis ensiformibus 0.75 mm longis margine inferiore fere ubique connata; fenestra basi columnae filamentarum 1 mm longa, 2 mm lata; ovarium 6–7-ovulatum; legumen ignotum.

Tree 7–30 m high, up to 75 cm in diameter, with terete glabrescent branches thickly dotted with prominent lenticels, the branchlets strigose to strigose-puberulent; stipules semipersistent, narrowly linear to awl-shaped, 6 mm long, 1 mm or less wide at the base, strigose without; leaves generally 13-, sometimes 11-, rarely 9-foliolate, 14–29 (averaging 23) cm long, the subterete petiole 4.5 (3)–5.5 cm long, this and the canaliculate rachis more or less strigose, the latter usually densely so; petiolules 3–5 mm long, strigose or hirtellous, dark brownish green, rather shallowly canaliculate above, frequently parasitized and then tubercled; leaflets stiffly chartaceous, elliptic-lanceolate, the blade 4–10 cm long, 1.75–4 cm wide, dark green and glabrous or sparsely strigose above, paler and strigose beneath, epunctate, the apex acuminate, the base acute or somewhat rounded, lateral veins about 15 pairs, stramineous, very prominent especially beneath; inflorescence terminal, the panicles 10–15, racemiform, loosely flowered, 5–14 cm long; primary peduncle subterete at the base, angled above, more or less appressed-puberulent, floriferous to within 1–2 cm of the base; secondary peduncles 0.5–1 mm long, strigose, two-flowered; pedicels 3–3.5 mm long, tawny-strigose, the caducous bractlets lanceolate, 1.5 mm long, strigose, attached midway on the pedicel; flowers 10–12 mm long, “pinkish to lavender” (Yuncker et al.); calyx cyathiform, rigid-chartaceous, 3 x 5–6 mm, densely tawny-strigose, the upper teeth almost obsolete, the lateral min-

ute (0.5 mm), the carinal prominent (1–1.5 mm), deltoid-acuminate; standard obovate-orbicular, 11–13 x 10–11 mm, copiously sericeous-strigose without, glabrous within, emarginate and slightly cucullate at the apex, tapering to the short auricles at the base, the claw (2.5 mm) thickened, extended as a short (0.25 mm) callous above each auricle; wings 13 mm long (the claw 4 mm), 4.75 mm wide, oblique-oblong, the vexillar margin elevated at the base and very slightly prolonged forming a short auricle, long-sericeous without along the median line, adnate to the keel near the base; keel petals 12.5 mm long (the claw 4.5 mm), 4.5 mm wide, semiorbicular, their lower margins united from just below the apex to within 2 mm of the claw, copiously sericeous-strigose with long (0.75 mm), stiff, white, flattened trichomes; stamens monadelphous, glabrous, the tube broadly fenestrate at the base, the vexillar stamen free only at the opening (1 mm) and there much broadened; anthers versatile, two-celled, broadly elliptic, 0.4–0.5 mm long; ovary compressed, linear, sessile, densely white-strigose; ovules 6–7; style glabrous; stigma capitate; pod unknown.

HONDURAS: DEPT. OF ATLANTIDA: Solitary in open grassland near the Cangrejil River, foothills back of Ceiba, July 29, 1938, *T. G. Yuncker, J. M. Koepper, & K. A. Wagner 8670* (F; US—type); wet thicket near Tela, Lancetilla Valley, alt. 20–600 m, Dec. 6, 1927–March 20, 1928, *P. C. Standley 55495* (F; US); DEPT. OF YORO: farm 43, near Progresso, Apr. 16, 1929, *W. D. Hottle 88* (F). All three collections were distributed as *L. michelianus* Pittier. Only the type collection is in flower.

Vernacular name: "Cincho."

Closely related to the Venezuelan *Lonchocarpus margaritensis* Pittier, from which it differs in its more numerous (13 rather than 7), acuminate, strigose (rather than velutinous) leaflets, terminal inflorescence, copious vesture of the keel (the trichomes in *L. margaritensis*, too, are less than 0.5 mm long, terete and softer) and short, broad opening (2 mm wide) in the stamen-tube (in *L. margaritensis* the opening is narrow and fully 2 mm long). Among the Middle American species, *L. orizabensis* Lundell (*L. affinis* Pittier, non Wildem.) is perhaps nearest *L. lasiotropis* but that species is at once distinguishable by its conspicuously impressed-nerved leaflets and its densely flowered, spiciform panicles with ferruginous-villose indument, filiform bractlets and small flowers.

#### *Lonchocarpus venustus*, sp. nov.

Arbor 6–10 m; folia 5–7-foliata, 20–30 cm longa; petioluli 8–10 mm longi dense puberulenti; foliola ovata vel ovato-lanceolata, 5–16 cm longa, conspicue punctata; paniculae 2–4, axillares, spiciformes densifloraeque; pedicelli 2.5–3 mm longi, strigosi; flores 10–12 mm longi; calyx cupuliformis margine undulata; vexillum late orbiculare; basi auriculatum margine involuta; alae obliquo-oblongae; carinae petala margine inferiore per dimidium terminale connata; ovarium 6–7-ovulatum; legumen ignotum.

Tree 6–10 m high, 25 cm in diameter, with "slippery gray bark" (Alexander and Hernández) and terete, glabrous branches; stipules small (1 x 2 mm), broadly ovate; leaves 5–7-foliolate, 20–30 cm long, the terete, often somewhat striate petiole (4–6 cm long) and subterete or slightly canaliculate rachis appressed-puberulent, becoming glabrate; petiolules 8–10 mm long, densely puberulent, canaliculate toward the blade, generally more or less rugose (especially that of the terminal leaflet) at least beneath; leaflets rather thick- or leathery-chartaceous, abruptly acuminate to (rarely) acute at the apex, conspicuously pellucid-punctate, glabrous above, densely appressed-puberulent becoming glabrate beneath, the 6–8 pairs of lateral veins prominent beneath, the lateral leaflets unequally ovate to ovate-lanceolate, the blade 5–11 cm long, 2.8–6 cm wide, the inner side rounded at the base, the outer cuneate, the terminal leaflet elliptic-ovate, the blade 10–16 cm long, 6–8 cm wide, cuneate at the base; panicles 2–4, axillary, spiciform, densely flowered, 22–32 cm long, the primary peduncles striate at the base becoming sharply angled above, rather sparingly appressed-puberulent, floriferous for three-fourths of their length; secondary peduncles 2 mm long, two-flowered, strigose, crowned with a pair of minute (0.5 mm), ovate, strigose, caducous bracts; pedicels 2.5–3 mm long, strigose, bearing a pair of subulate, strigose bractlets (1 mm long) at or below the middle; flowers 10–12 mm long, "light rose-lilac, with a white spot [at base of standard?], very fragrant" (Alexander and Hernández); calyx cupuliform, 3 x 4–5 mm, sparsely strigose, the lower half yellowish green and frequently purple-spotted, the terminal half cinnamon-brown, the margin undulate, the teeth (except the deltoid carinal tooth, 0.5 mm long) almost obsolete; standard broadly orbicular (12 x 13 mm), sericeous without and in the center and

along the median longitudinal axis within, deeply emarginate, involute at the auriculate base forming crests or flaps 1 mm high on the inner margins of the auricles, the claw 2 mm long; wings 11–12.5 mm long (the claw 4.5 mm), 5 mm wide, oblique-oblong, auriculate at the base on the vexillar margin, sericeous without along the median line, adnate to the keel near the base; keel petals 11.5 mm long (the claw 4 mm), 4.5 mm wide, their lower margins united for the terminal half, conspicuously lineate and minutely sericeous; stamens monadelphous, glabrous, the tube fenestrate at the base; anthers two-celled, versatile, elliptic, 0.75 mm long; ovary linear, somewhat compressed, sessile, densely short-sericeous; ovules 6–7; style ciliate along the lower margin; stigma capitate; pod unknown.

MEXICO: GUERRERO: Chilpacingo to Iguala, Aug. 11, 1945, *E. J. Alexander and E. Hernández Xolocotzi 151* (USNA—type: USNH); MEXICO: Large tree, Bejuocos, alt. 610 m, Dist. of Temascaltepec, Aug. 26, 1932, *G. B. Hinton 1473* (F); Limones, Dist. of Temascaltepec, Aug. 16, 1935, *G. B. Hinton 8179* (F). Both Hinton collections were distributed as *L. guatemalensis*.

Vernacular name: "Palo de Aro."

*Lonchocarpus venustus* has characteristics in common with *L. michelianus* Pittier, *L. malacotrichus* Harms, and *L. caudatus* Pittier. From the first of these it is readily distinguished by its elongate, densely-flowered panicles, its short secondary peduncles (2, rather than 4–5, mm long) and pedicels (2.5–3, rather than 6–7, mm long), and its fewer and much larger leaflets. Distinctions from *L. malacotrichus* are more difficult to give with certainty because that species is still known in this country only from the description and a fragment of the type specimen. The latter shows the presence of large bractlets at the base of the calyx which are not present in *L. venustus*, and the vesture of an apparently rather young leaflet is densely villous rather than appressed-puberulent. Furthermore the leaflet does not seem to be punctate, as described, although groups of cells here and there are translucent owing to insect or fungus attack. No flowering material of *Lonchocarpus caudatus* is yet known; hence the difficulty of comparing it with the present species of which the legume is unknown. The punctate leaflets of *L. venustus* should set it off readily enough from *L. caudatus*, but it is questionable whether the latter species actually is epunctate or whether puncta which may have been pellucid

in the young leaves have become filled by some opaque secretion with age, this being the impression obtained when the leaflets are examined by intense transmitted light. The general shape of the leaflets, the relative lengths of petioles and petiolules and the unusually stout axillary primary peduncles are very similar in the two species. The leaves are much more nearly glabrous in *L. caudatus* than in *L. venustus*, the leaflets more coriaceous (nor do they show the cuneate base which prevails in the outer half of the lateral leaflets of *L. venustus*) and the pedicels longer (5 mm); but until these three plants are all known in their complete seasonal transformations their true relationship must remain in doubt.

*Lonchocarpus resinosis*, sp. nov.

Arbor 5 m; folia 5-foliata; foliola elliptico-lanceolata, punctata, margine per dimidium terminale crenulata; paniculae 3–6, axillares, racemiformes laxifloraeque; pedicelli canescentes bracteolis duobus squamiformibus supra medium praediti; flores 13–15 mm longi; calyx cupuliformis, coriaceus, resiniferus, margine subintegra; vexillum late orbiculare canaliculis resinosis purpureis maculatum, basi profunde cordatum; alae obliquo-oblongae; carinae petala margine inferiore solum medio connata; ovarium 5–6-ovulatum; legumen ignotum.

Tree 5 m high, 25 cm in diameter, with gray bark and terete, glabrous branches; stipules minute; leaves 5-foliolate, 19–26 cm long (the terete, glabrous petioles 5–7 cm long), the rachis shallowly channeled and sparsely puberulent above; petiolules 7–8 mm long, deeply rugose, canaliculate and faintly puberulent above; leaflets coriaceous, elliptic-lanceolate to slightly obovate-lanceolate, the blade 4.5–11 cm long, 2–6 cm wide, dark green above, much paler beneath, the apex acuminate to short-caudate, the base cuneate, pellucid-punctate, the resin-ducts occasionally much elongated, glabrous above and below except the midrib and sometimes the lateral veins sparsely short-pilose, the lateral veins 5–9 pairs, very prominent on both surfaces, the margin indurated, crenulate from below the middle to the apex; panicles 3–6, axillary, racemiform, loosely flowered, 4–17 cm long; primary peduncles terete at the base, becoming striate and finally strongly angled and canescent above, floriferous for about three-fourths of their length; secondary peduncles 3–4 mm long, canescent; pedicels 4–5 mm long, canescent, with a pair of scale-like bractlets (0.75

mm) above the middle; flowers 13–15 mm long, “purplish-rose, the spot greenish-white turning purple” (Alexander and Hernández); calyx cupuliform, coriaceous, 4 x 5–6 mm, minutely and sparingly strigose, heavily lined throughout with dark purplish brown resin-ducts, the margin ciliolate, subentire, a minute carinal tooth perceptible; standard broadly orbicular, 12–13 x 14–15 mm, finely sericeous without and in the center within, dotted with purplish red resin ducts, especially toward the deeply emarginate apex, deeply cordate at the base, forming long narrow, involute auricles equaling the claw (2 mm); wings 13.5 mm long (the claw 4 mm), 5 mm wide, oblique-oblong, the vexillar margin prolonged at the base and somewhat auriculate, very sparingly sericeous without along the median line, with conspicuous broken lines of resin-ducts, adnate to the keel near the base; keel petals 14 mm long (the claw 4.5 mm), 4.5 mm wide, falcate, obtuse at the apex, their lower margins united in the center but free at either end, heavily marked with broken lines of dark resin-ducts, minutely and sparingly sericeous; stamens monadelphous, glabrous, the tube fenestrate at the base, the vexillar stamen free throughout its lower half and the filament much broadened at the base; anthers versatile, two-celled, elliptic, 0.75 mm long; ovary linear, somewhat compressed, sessile, densely short-sericeous; ovules 5–6; style sparingly sericeous below, glabrate above; stigma capitellate; pod unknown.

MEXICO: GUERRERO: Cañon de los Sabinos, ca. 60 km west of Iguala, Aug. 9, 1945, *E. J. Alexander and E. Hernández Xolocotzi 63* (USNA-type; USNH).

Vernacular name: “Rosa morada.”

Apparently related to *L. michelianus* Pittier, from which it is at once set off by its coriaceous, glandular-blotched calyx, its strongly auriculate standard, bractlets distant from the calyx, elongate, loosely-flowered inflorescence and fewer, larger, coriaceous, elliptic-lanceolate, prominently veined, crenulate leaflets.

***Lonchocarpus spectabilis*, sp. nov.**

Arbor 7 m; folia 11–15-foliata, 21–30 cm longa, rhachi petiolulusque tomentosis; foliola elliptica vel oblanceolata, epunctata, utrinque molliter strigosa; paniculae 3–5, axillares, racemiformes; pedicelli 7–9 mm longi, tomentosi; flores ca. 2 cm longi purpurei vexillo macula albida; calyx cupuliformis vel cyathiformis margine truncata vel undulata; vexillum orbiculare abrupte auriculatum; alae cymbiformes; carinae petala margine in-

feriore connata; ovarium 4–6-ovulatum; legumen ignotum.

Tree 7 m high, with smooth gray bark and terete, densely puberulent branches; stipules small (1.5 mm long), broadly ovate; leaves 11–15-foliolate, 21–30 cm long, the petiole (5–6 cm long, subterete), rachis and petiolules (5–6 mm long) tomentose; leaflets rather stiffly chartaceous, elliptic or oblong-elliptic to oblanceolate, the blade 3.5–9 cm long, 1.5–3 cm wide (averaging 6.5 x 2 cm), the apex somewhat acute to obtuse, rounded to gradually tapering at the base, epunctate, softly strigose above and below, with about ten pairs of lateral veins which are prominent and puberulent beneath as is the somewhat impressed midrib on both surfaces; panicles 3–5, axillary, racemiform, 18–26 cm long, the primary peduncles terete, densely puberulent, floriferous for about half their length, the secondary 2–4 mm long 2-flowered, unevenly puberulent; bracts caducous, not seen; pedicels 7–9 mm long, tomentose, bearing a pair of filiform-subulate bractlets (1.25 mm long) above the middle; flowers averaging 2 cm (15–23 mm) long, when fresh “purple with a whitish spot on standard” (Alexander and Hernández); calyx cupuliform to cyathiform, densely appressed-puberulent, in anthesis 3 mm long, 8 mm wide, the margin truncate or somewhat undulate, the carinal tooth rudimentary, the others obsolete; standard orbicular (19 x 19 mm), sericeous without, glabrous within, emarginate, abruptly auriculate, the short claw (2.5–3 mm) thickened; wings cymbiform, 20 mm long (the claw 4.5–5 mm), 8 mm wide, sparsely sericeous along the center without, exceeding the keel and adherent to it toward the base; keel petals 17–18 mm long (the claw 5 mm), 7 mm wide, their terminal half united along the lower margin, conspicuously sericeous along lower margin especially toward the broadly rounded apex; stamens monadelphous, glabrous, the tube fenestrate at the base; ovary linear, compressed, sessile, densely sericeous; ovules 4–6; style slightly hirtellous along the upper margin; stigma capitellate; pod unknown.

MEXICO: GUERRERO: Taxco to Iguala, Aug. 3, 1945, *E. J. Alexander and E. Hernández Xolocotzi 3* (USNA - type).

Vernacular name: “Gallito.”

Nearest allied to *Lonchocarpus orizabensis* Lundell (*L. affinis* Pittier, non Wildem.), from which it differs in its strikingly large flowers (fully equaling those of *L. megalanthus* Pittier, which have been the largest heretofore known in the

genus), the standard, wings and keel being 3 to 4 times the size of those in that species, in its rudimentary calyx-teeth and in its elongate pedicels (7-9, rather than 2-3, mm).

*Lonchocarpus sinaloensis* (Gentry), comb. nov.

*Piscidia sinaloensis* Gentry, *Brittonia* 6: 316. 1948.

The paired flowers and rudimentary calyx teeth of this species, as well as its close similarity to *Lonchocarpus oaxacensis* and *L. megalanthus*, indicate that its position is properly in the genus *Lonchocarpus*.

The original description may be supplemented by the following diagnostic characters, taken from an isotype (*Gentry 5525*) and a paratype (*Gentry 5937*, distributed as *Brongniartia* sp.) in the National Arboretum Herbarium, since they become significant for the plant in its new position.

Petioliules 3 mm long, gray-puberulent, canaliculate above; leaflets coriaceous, pellucid-punctate, early glabrescent except along the veins; panicles about 12, axillary; secondary peduncles 3-5 mm long, terminated by two pedicels and a subulate, adaxial projection of the axis 1-1.5 mm long; bractlets suborbicular, 2 x 2.5 mm, densely sericeous; calyx teeth shallow in the bud, almost obsolete in anthesis; standard 15 mm wide, minutely but copiously sericeous without; wings finely sericeous along the median line and sometimes the basal half without, the blade 10-11.5 mm, the claw 6.5-7 mm long; keel petals united at the middle along their lower margin, sericeous without, glabrate within except near the lower margin; stamens monadelphous, glabrous, the tube fenestrate at the base, the margins of the opening thickened, the tube greatly broadened toward the base, the filament of the vexillar stamen widened at the base and free only at the opening (3 mm); anthers large (1 mm long), ovate, versatile but attached near the base; ovary sessile, linear, compressed, densely canescent; ovules 5.

The affinities of *L. sinaloensis* and the characteristics by which it is most readily distinguished from its nearest allies are indicated in the key to the *L. guatemalensis* group at the end of the following discussion.

#### LONCHOCARPUS GUATEMALENSIS AND ALLIES

One of the most natural groups within the genus is comprised of *Lonchocarpus guatemalensis* Benth., widely distributed in Middle America,

and the plants proposed as *L. proteranthus* Pittier (Panama), *L. oaxacensis* Pittier (Oaxaca), *L. darienensis* Pittier (Panama), *L. dumetorum* Brandergee (for reference of this name to synonymy with *L. darienensis* cf. *Journ. Washington Acad. Sci.* 38: 12. 1948), *L. megalanthus* Pittier (Nayarit to Michoacán), *L. mexicanus* Pittier (Veracruz), and *L. sinaloensis* (Gentry) Hermann (Sinaloa). In Pittier's systematic arrangement affinity is indicated between only three of the seven of these plants there treated; *L. proteranthus* is isolated in his section *Punctati* of subgenus *Eulonchocarpus*, *L. oaxacensis* is placed near the beginning of section *Epunctati* and *L. darienensis*, *L. megalanthus*, and *L. mexicanus* are grouped at the end of the same section, which also falls under *Eulonchocarpus*, while *L. guatemalensis* is assigned a place in section *Carinati* of the subgenus *Neuroscapha*. But the legumes in the type specimen of *L. proteranthus* do not have the vexillar margin "sharp-edged or rounded"; rather it is deeply and conspicuously concave (a characteristic already noted in the half-grown fruits of the type of *L. guatemalensis* by Bentham), though it is scarcely thickened. In this respect the pods resemble those of *L. hondurensis* and *L. lanceolatus* and the plant would therefore be referable to *Neuroscapha* with as much reason as are those two species, but at any rate it must be excluded from *Eulonchocarpus*. Fruiting material of *L. guatemalensis* and *L. megalanthus*, which was either unidentified at the time of Pittier's monograph or turned up later, is characterized by the same type of pods. The leaflets of all these entities are predominantly pellucid-punctate (conspicuously so in the type collections of all except that of *L. oaxacensis* where the puncta are obscure except under very strong light), so that another supposed character for distinguishing between them is found to be untenable. Leaflet shape, one of the two bases for the segregation of *L. mexicanus*, is of doubtful diagnostic value, since the leaflets in typical *L. guatemalensis* alone vary from narrowly elliptic through lanceolate and ovate to almost orbicular. *Lonchocarpus megalanthus* and *L. guatemalensis* are sometimes proteranthous and sometimes not. There appears to be no reason for assuming that others of the group are any more constant in this respect.

Apart from the amply distinct *L. sinaloensis* and *L. oaxacensis*, it is apparent that the remaining plants of this group fall into two ill-defined but generally recognizable assemblages: on the one hand *L. guatemalensis* and *L. darienensis*

(which I am unable to interpret as anything but a depauperate phase of *L. guatemalensis*) and, on the other, *L. megalanthus*, *L. proteranthus* and *L. mexicanus*. The more tangible characters separating the two assemblages appear to be the following:

Flowers 13 (rarely 12)–21 mm long; calyx in anthesis generally 7 mm wide or more, usually sparsely sericeous (except in *L. mexicanus*); rachis of inflorescence glabrate; secondary peduncles usually 2–2.5 mm long . . . *L. megalanthus*, *L. mexicanus*, and *L. proteranthus*.

Flowers 10–13 mm long; calyx in anthesis generally 6 mm wide or less, usually densely sericeous; rachis of inflorescence densely canescent; secondary peduncles usually 0.5–1 mm long . . . *L. guatemalensis* (including *L. darienensis*).

These apparently salient characters are not found to be consistently correlated, however. Thus *Hinton 13745*, has secondary peduncles up to 2.5 mm long, the calyx sparsely pubescent and the rachis glabrate, but the flowers are only 11–12 mm long and the calyx only 4–5 mm wide; *Galeotti 1756* likewise has secondary peduncles 2.5 mm long and calyx often 7 mm wide but copiously sericeous, whereas the rachis is canescent and flowers rarely as long as 13 mm; *Ortega 5111*, with predominantly *megalanthus* characteristics, the flowers attaining a length of even 18 mm, has rudimentary secondary peduncles; *Rose et al. 14516* has the sparsely sericeous calyx, glabrate rachis and somewhat larger bracts of *L. megalanthus* but secondary peduncles only 1.25 mm long, calyx 6 mm wide and flowers 11–13 mm long; *Lundell 2740* is *L. guatemalensis* except in wide calyces; *Gentle 2483* is *L. guatemalensis* except in long secondary peduncles, etc.

Transitional forms between typical *L. guatemalensis* (including *L. darienensis*), on the one hand, and *L. megalanthus*, *L. proteranthus* and *L. mexicanus* on the other are sufficiently frequent, in fact, as to vitiate any attempt to maintain the latter three as species. Yet because they are so readily recognizable in their extreme forms (particularly *L. megalanthus* with its strikingly showy flowers almost twice the size of those of *L. guatemalensis*), the following new combinations may prove useful to those who wish nomenclatorial designation for such extremes. The varietal category seems to be appropriate as indicating their geographic segregation: *L. megalanthus* being restricted, so far as known, to a relatively narrow area in western Mexico from Sinaloa south to

northwestern Michoacán, *L. mexicanus* to southern Veracruz near the eastern coast of Mexico, and *L. proteranthus* to Panama, whereas typical *L. guatemalensis* is predominantly a tree of Guatemala, British Honduras, El Salvador, and Honduras, with outlying posts in Sinaloa, Yucatán, Nicaragua, and Costa Rica.

***Lonchocarpus guatemalensis* Benth., var. *megalanthus* (Pittier), stat. nov.**

*L. megalanthus* Pittier, Contr. U. S. Nat. Herb. 20: 70. 1917.

Collections typical of this extreme are: NAYARIT: Tepic, *Palmer 1997* (F; US). JALISCO: San Sebastián, *Mexia 1784* (F; US) and *1870a* (US). MICHOACÁN: Aquila, Dist. of Coahuila, *Hinton 15818* (US).

A fruiting collection (*Ortega 6353*) from Sinaloa can be only tentatively referred here, since it lacks peduncles and pedicels as well as flowers.

***Lonchocarpus guatemalensis* Benth., var. *proteranthus* (Pittier), stat. nov.**

*L. proteranthus* Pittier, l.c. 63.

***Lonchocarpus guatemalensis* Benth., var. *mexicanus* (Pittier), stat. nov.**

*L. mexicanus* Pittier, l.c. 71.

The plants of the whole *guatemalensis*-alliance may be distinguished as follows:

Bractlets broadly orbicular, 2 x 2.5 mm; secondary peduncles (3–5 mm long) terminated by a projection of the axis 1–1.5 mm long . . . *L. sinaloensis*.

Bractlets oblong or ovate, 1 mm or less long and wide; secondary peduncles without a projection or when rarely present this rudimentary (0.5 mm long or less).

Leaflets tomentellous beneath; calyx teeth prominent in anthesis; secondary peduncles slender, 3–6 mm long . . . *L. oaxacensis*.

Leaflets glabrous or early glabrescent; calyx teeth shallow or obsolete in anthesis; secondary peduncles stout, 0.5–2.5 (rarely 3) mm long.

Flowers 10–13 mm long; calyx in anthesis generally 6 mm wide or less, usually densely sericeous; rachis of the inflorescence densely canescent; secondary peduncles usually 0.5–1 mm long . . . *L. guatemalensis* (including *L. darienensis*).

Flowers 13 (rarely 12)–21 mm long; calyx in anthesis generally 7 mm wide or more, usually sparsely sericeous (except in var. *mexicanus*); rachis of inflorescence glabrate; secondary peduncles usually 2–2.5 mm long.

Calyx densely silvery-sericeous, almost black in appearance (actually very dark red); leaflets broadly rounded at base (Veracruz) . . . *L. guatemalensis* var. *mexicanus*.

Calyx sparsely silvery-sericeous; leaflets tapering at base.

Mature pods relatively smooth and coriaceous; calyx dark red (Panama). *L. guatemalensis* var. *proteranthus*.

Mature pods scarious (?); calyx pale reddish brown (Sinaloa to Michoacán) . . . *L. guatemalensis* var. *megalanthus*.

## Obituaries

ALBERT FRED WOODS, distinguished agricultural scientist, administrator, and educator, died at Prince Georges General Hospital near Washington, D. C., on April 12, 1948, after an illness of five months. He was born on December 25, 1866, at Belvedere, Ill., and grew up on his father's cattle ranch in Nebraska. He is survived by his wife, Bertha Davis Woods, and by two sons, Mark Winton, of the National Institutes of Health, and Winton de Ruyter, a lawyer of Dayton, Ohio.

His collegiate education was obtained at the University of Nebraska. From this institution he received the degrees B.Sc. in 1890, A.M. in 1892, and D.Agr. in 1913. Further degrees were conferred by St. Johns College, Annapolis, Md. (LL.D., 1923), and the University of Maryland (Sci.D., 1932).

At the beginning of his career Dr. Woods served as assistant botanist at the University of Nebraska (1890-93) under the renowned botanist Prof. Charles E. Bessey. While there he prepared a beautifully illustrated account of the Characeae of Nebraska, which was published as part of a general flora of the State.

During the last two decades of the nineteenth century the science of plant pathology was comparatively new in this country. In the U. S. Department of Agriculture this field of research had its official beginnings in 1886, at which time the Congress included in its appropriation a clause that provided for "investigating the needs of diseases of fruits and fruit trees, grains, and other useful plants due to parasitic fungi. . . ." Early approaches to this subject had hitherto been focused mainly on the fungi concerned. The experience of workers with plant diseases, however, had been gradually forcing them to the conclusion that the problems of pathology and physiology of plants are so intimately related as to make impossible any satisfactory solutions in pathology without entering the field of physiology. Dr. Woods's university training and experience, together with his early farm back-

ground, had peculiarly fitted him for this combined type of work. To fill this crucial need in the Federal Department of Agriculture in 1893 he was brought in as assistant chief and first assistant physiologist of its Division of Vegetable Pathological and Physiological Investigations and served in these capacities until 1901.

Prominent among his research publications during this period were those on water as a factor in the growth of plants, principles of pruning and care of wounds, the Bermuda lily disease, the mosaic disease of tobacco, fumigation of greenhouses and cold frames with hydrocyanic-acid gas, the stigmonose of carnations, and inoculation of the soil with nitrogen-fixing bacteria.

With the organization of crop research under the new Bureau of Plant Industry established in 1901, Dr. Woods was appointed pathologist and physiologist and assistant chief. His new duties made it necessary to give more of his time and attention to administrative affairs. Although deeply interested in administration, he preferred research—that was his first love. Illustrative of his inner feelings was the following advice to his son Mark, when a high-school student carrying out experiments in his basement laboratory: "If you have a chance to choose between research and administrative work, choose research." One of Dr. Woods's greatest assets as an administrator was this basic regard for research. He felt that administration should always be an actual part of research, and in all the administrative positions which he held throughout his entire active career this principle remained his guiding star.

Over these years numerous articles from his pen appeared in various journals and as Department publications. These included critical appraisals of the relationships of nutrition to plant health and of plant physiology to horticultural and agricultural development. Even at this early day, Dr. Woods had placed special emphasis on the importance of obtaining disease-resistant